



SEQUENCE LISTING

<110> Houghton, Michael  
Choo, Oui-Lim  
Kuo, George

<120> Hepatitis C virus protease

<130> 223002010004

<140> 09/884,455  
<141> 2001-06-18

<150> 09/253,675  
<151> 1999-02-18

<150> 08/709,177  
<151> 1996-09-06

<150> 08/440,548  
<151> 1995-05-12

<150> 08/350,884  
<151> 1994-12-06

<150> 07/680,296  
<151> 1991-04-04

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<150> 07/505,433  
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Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr  
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Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys

35 40 45  
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr  
50 55 60  
Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly  
65 70 75 80  
Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met  
85 90 95  
Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly  
100 105 110  
Thr Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu  
115 120 125  
Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser  
130 135 140  
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser  
145 150 155 160  
Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe  
165 170 175  
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile  
180 185 190  
Pro Val Glu Asn Leu Glu Thr Thr Met Arg  
195 200

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<400> 2

Cys Trp Thr Val Tyr His Gly Ala Gly  
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Asp Gln Asp Leu Gly Trp Pro Ala Pro  
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Leu Lys Gly Ser Ser Gly Gly Pro Leu  
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Phe His Thr Met Trp His Val Thr Arg  
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<210> 6

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Pro Ser Gly Thr Ser Gly Ser Pro Ile  
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<210> 8

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<213> West Nile Fever virus

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<223> West Nile Fever virus protease

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Phe His Thr Leu Trp His Thr Thr Lys

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Pro Thr Gly Thr Ser Gly Ser Pro Ile  
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Phe His Thr Leu Trp His Thr Thr Arg  
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Phe His Thr Leu Trp His Thr Thr Lys  
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<210> 17  
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Thr Ala Gly His Cys  
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<210> 18

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<212> PRT

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<220>

<223> S. griseus A protease

<400> 18

Asn Asn Asp Tyr Gly Ile Ile  
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<213> Myxobacter 495

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<223> alpha-Lytic protease

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Thr Ala Gly His Cys  
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<223> alpha-Lytic protease

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<220>  
<223> Bovine Trypsin protease

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Ser Ala Ala His Cys  
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<210> 24  
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<212> PRT  
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<220>  
<223> Bovine Trypsin protease

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<212> PRT  
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<220>  
<223> Bovine Trypsin protease

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Gly Asp Ser Gly Gly Pro Val  
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<210> 26  
<211> 5

<212> PRT  
<213> Chymotrypsin

<400> 26  
Thr Ala Ala His Cys  
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<210> 27  
<211> 7  
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<213> Chymotrypsin

<400> 27  
Asn Asn Asp Ile Thr Leu Leu  
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<210> 28  
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<210> 29  
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Thr Ala Ala His Cys  
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<210> 30  
<211> 7  
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<213> porcine

<220>  
<223> Elastase protease

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Gly Tyr Asp Ile Ala Leu Leu  
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<210> 31  
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<213> porcine

<220>

<223> Elastase protease

<400> 31

Gly Asp Ser Gly Gly Pro Leu

1 5

<210> 32

<211> 5

<212> PRT

<213> Hepatitis C virus

<220>

<223> HCV protease

<400> 32

Thr Val Tyr His Gly

1 5

<210> 33

<211> 7

<212> PRT

<213> Hepatitis C virus

<220>

<223> HCV protease

<400> 33

Ser Ser Asp Leu Tyr Leu Val

1 5

<210> 34

<211> 7

<212> PRT

<213> Hepatitis C virus

<220>

<223> HCV protease

<400> 34

Gly Ser Ser Gly Gly Pro Leu

1 5

<210> 35

<211> 75

<212> PRT

<213> S. cerevisiae

<400> 35

Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu Glu Val

1 5 10 15  
Glu Ser Ser Asp Thr Ile Asp Asn Val Lys Ser Lys Ile Gln Asp Lys  
20 25 30  
Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly Lys Gln  
35 40 45  
Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln Lys Glu Ser  
50 55 60  
Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly  
65 70 75

<210> 36  
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<400> 36  
Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly  
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<210> 37  
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38

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<220>  
<223> linker

<400> 38  
gatcctgaat tcctgataa

19

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<223> linker

<400> 39  
gacttaagga ctattttaa  
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<211> 19  
<212> DNA  
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<223> linker

19

<400> 40  
gatccgaatt ctgtgataa  
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<223> linker

19

<400> 41  
gcttaagaca ctatttaa  
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<212> DNA  
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<223> linker

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<400> 42  
gatcctggaa ttctgataa  
<210> 43  
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<212> DNA  
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<400> 43  
gacctaaga ctatttaa 19

<210> 44  
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<400> 44  
atcaggaccc gggtgagaac aattaccact 30

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aagccaccgt gtgcgctagg gctcaagccc 30

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<400> 46  
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<400> 47  
tgcatcaatg gggtgtgctg g 21

<210> 48  
<211> 28  
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<223> probe

<400> 48  
agagacaacc atgaggtccc cggtgttc

28

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<212> DNA  
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<223> probe

<400> 49  
ctgttgtgcc ccgcggcagc c

21

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<211> 22  
<212> DNA  
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<220>  
<223> primer

<400> 50  
cccgagcaag atctcccgac cc

22

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<400> 51  
cccggtcgca taagcagtgc acttgga

27

<210> 52  
<211> 37  
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<400> 52

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37

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Met Asp Tyr Lys Asp Asp Asp Asp Lys Gly Arg Glu

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<210> 54

<211> 30

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<400> 54

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<220>

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<400> 55

aatttggaa ttccataatt aattaag

27

<210> 56

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<212> DNA

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<223> adapter

<400> 56

tcgacttaat taattatgga attccca

27

<210> 57

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> adapter

<400> 57

aatttggaa ttccataatg ag

22

<210> 58

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> adapter

<400> 58

tcgactcatt atggaattcc ca

22

<210> 59

<211> 71

<212> DNA

<213> Artificial Sequence

<220>

<223> leader

<400> 59

aattcgtaaa tcctgtgtgc taattgaggt gcattggct gcaaatcgag ttgctaggca  
ataaacacat t

60

71

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<212> DNA

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<220>

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<400> 61

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62

<210> 62

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<220>

<223> leader

<400> 62

cagacatgtt ctggtcagtt ctctgctaatt cgctcaacga acgattaaaaa ttaatccaaa  
tgtgtt

60  
66

<210> 63

<211> 11

<212> PRT

<213> Hepatitis C virus

<400> 63

Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr

1 5 10

<210> 64

<211> 9

<212> PRT

<213> Hepatitis C virus

<400> 64

Leu Lys Gly Ser Ser Gly Gly Pro Leu

1 5

<210> 65

<211> 202

<212> PRT

<213> Hepatitis C virus

<400> 65

Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser  
1 5 10 15

Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr  
20 25 30

Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys

35	40	45
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr		
50	55	60
Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly		
65	70	75
Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met		
85	90	95
Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly		
100	105	110
Thr Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu		
115	120	125
Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Gly Asp Ser		
130	135	140
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser		
145	150	155
Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe		
165	170	175
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile		
180	185	190
Pro Val Glu Asn Leu Glu Thr Thr Met Arg		
195	200	

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<212> PRT

<213> Hepatitis C virus

<400> 66

Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His			
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Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser			
20	25	30	
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys			
35	40	45	
Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu			
50	55	60	
Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu			
65	70	75	80
Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly			
85	90	95	
Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly			
100	105	110	
Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys			
115	120	125	
Ile Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg			
130	135	140	
Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val			
145	150	155	160
Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu			
165	170	175	
Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His			
180	185	190	

Ala Asp Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu  
 195 200 205  
 Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro  
 210 215 220  
 Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
 225 230 235 240  
 Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
 245 250 255  
 Leu Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro  
 260 265 270  
 Pro Val Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr  
 275 280 285  
 Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala  
 290 295

<210> 67

<211> 199

<212> PRT

<213> Hepatitis C virus

<400> 67

Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
 1 5 10 15  
 Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
 20 25 30  
 Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
 35 40 45  
 Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu  
 50 55 60  
 Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu  
 65 70 75 80  
 Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly  
 85 90 95  
 Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly  
 100 105 110  
 Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys  
 115 120 125  
 Ile Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg  
 130 135 140  
 Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val  
 145 150 155 160  
 Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu  
 165 170 175  
 Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His  
 180 185 190  
 Ala Asp Val Ile Pro Val Arg  
 195

<210> 68

<211> 299

<212> PRT

<213> Hepatitis C virus

<400> 68

Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu Arg Asp Trp Ala His  
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Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Val Phe Ser  
20 25 30  
Gln Met Glu Thr Lys Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys  
35 40 45  
Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu  
50 55 60  
Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu  
65 70 75 80  
Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly  
85 90 95  
Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly  
100 105 110  
Glu Val Gln Ile Val Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys  
115 120 125  
Ile Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg  
130 135 140  
Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val  
145 150 155 160  
Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu  
165 170 175  
Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His  
180 185 190  
Ala Asp Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu  
195 200 205  
Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro  
210 215 220  
Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
225 230 235 240  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
245 250 255  
Leu Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro  
260 265 270  
Pro Val Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr  
275 280 285  
Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala  
290 295

<210> 69

<211> 2064

<212> DNA

<213> Hepatitis C virus

<400> 69

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atcacgtggg gggcagatac cgccgcgtgc ggtgacatca tcaacggctt gcctgtttcc 180  
gcccccgaggc gcccgggatg actgctcggt ccagccgatg gaatggtctc caagggttgg 240  
agttgctgg cgcccatcac ggcgtacgcc cagcagacaa ggggcctcct agggtgcata 300

atcaccagcc	taactggccg	ggacaaaaac	caagtggagg	gtgaggtcca	gattgtgtca	360
actgctgcc	aaaccttct	ggcaacgtgc	atcatcaatg	gggtgtgctg	gactgtctac	420
cacggggccg	gaacgaggac	catcggtca	cccaagggtc	ctgtcatcca	gatgtatacc	480
aatgttagacc	aagacctgt	gggctggccc	gcttcgaag	gtacccgctc	attgacaccc	540
tgcacttgcg	gctcctcgga	ccttacctg	gtcacgaggc	acgcccgtat	cattcccgta	600
cgccggcggg	gtgatagcag	gggcagcctg	ctgtcgcccc	ggcccatattc	ctacttgaaa	660
ggctcctcg	ggggccgct	gttgcgc	gccccggcacg	cgtgggcat	attagggcc	720
gccccgtgca	cccgtggagt	ggctaaggcg	gtggactta	tccctgtgga	gaacctagag	780
acaaccatga	ggtccccgg	gttcacggat	aactccttc	caccagtat	gccccagagc	840
ttccagggtgg	ctcacctcca	tgctcccaca	ggcagcggca	aaagcaccaa	ggtcccgac	900
gcatatgcag	ctcagggcta	taaggtgcta	gtactcaacc	cctctgttgc	tgcaacactg	960
ggcttgggt	cttacatgtc	caaggctcat	gggatcgatc	ctaacatca	gaccgggggt	1020
agaacaat	ccactggcag	ccccatcacg	tactccac	acggcaagtt	ccttgggac	1080
ggcgggtgt	cggggggcgc	ttatgacata	ataatttgc	acgagtgcca	ctccacggat	1140
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ctgggtgtc	tcgcccaccgc	caccctccg	ggctccgtca	ctgtgc	tcccaacatc	1260
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gaagtaatca	aggggggggag	acatctcatc	ttctgtcatt	caaagaagaa	gtgcacgaa	1380
ctcgccgcaa	agctggcgc	attggcattc	aatgccgtgg	cctactaccg	cggtcttgac	1440
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ggctataccg	gcgacttcga	ctcggtata	gactgcaata	cgtgtgtcac	ccagacagtc	1560
gatttcagcc	ttgaccctac	cttcaccatt	gagacaatca	cgtccccca	agatgtgtc	1620
tcccgactc	aacgtcg	caggactggc	agggggaaagc	caggcatcta	cagatttgc	1680
gcaaccgggg	agcgcctcc	cggcatgtt	gactcg	tcctctgtga	gtgctatgac	1740
gcaggctgt	cttggat	gctcacgccc	gccgagacta	cagttaggc	acgagcgtac	1800
atgaacaccc	cgggcttcc	cgtgtccag	gaccatctt	aattttggaa	gggcgtctt	1860
acaggcctca	ctcatataga	tgcccactt	ctatcccaga	caaagcagag	tggggagaac	1920
cttccttacc	tggtagcgta	ccaagccacc	gtgtgcgt	ggctcaagc	ccctccccca	1980
tcgtgggacc	agatgtggaa	gtgttgatt	cgcctca	ccaccctcca	tgggcaaca	2040
ccccctgtat	acagactggg	cgct				2064

<210> 70

<211> 686

<212> PRT

<213> Hepatitis C virus

<400> 70

Gly	Thr	Tyr	Val	Tyr	Asn	His	Leu	Thr	Pro	Leu	Arg	Asp	Trp	Ala	His
1									10					15	
Asn	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	Pro	Val	Val	Phe	Ser
									20		25			30	
Gln	Met	Glu	Thr	Lys	Leu	Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys
									35		40			45	
Gly	Asp	Ile	Ile	Asn	Gly	Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu
									50		55			60	
Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Met	Val	Ser	Lys	Gly	Trp	Arg	Leu
									65		70			75	80
Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly
									85		90			95	
Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val	Glu	Gly
									100		105			110	
Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala	Thr	Cys

115 120 125  
Ile Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg  
130 135 140  
Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val  
145 150 155 160  
Asp Gln Asp Leu Val Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu  
165 170 175  
Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His  
180 185 190  
Ala Asp Val Ile Pro Val Arg Arg Gly Asp Ser Arg Gly Ser Leu  
195 200 205  
Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro  
210 215 220  
Leu Leu Cys Pro Ala Gly His Ala Val Gly Ile Phe Arg Ala Ala Val  
225 230 235 240  
Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn  
245 250 255  
Leu Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro  
260 265 270  
Pro Val Val Pro Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr  
275 280 285  
Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly  
290 295 300  
Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe  
305 310 315 320  
Gly Ala Tyr Met Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr  
325 330 335  
Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr  
340 345 350  
Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile  
355 360 365  
Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly  
370 375 380  
Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val  
385 390 395 400  
Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro  
405 410 415  
Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr  
420 425 430  
Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile  
435 440 445  
Phe Cys His Ser Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val  
450 455 460  
Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser  
465 470 475 480  
Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ala Thr Asp Ala Leu  
485 490 495  
Met Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr  
500 505 510  
Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile  
515 520 525  
Glu Thr Ile Thr Leu Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg

530	535	540
Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro		
545	550	555
Gly Glu Arg Pro Pro Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys		
565	570	575
Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr		
580	585	590
Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln		
595	600	605
Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly Leu Thr His Ile		
610	615	620
Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly Glu Asn Leu Pro		
625	630	635
Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro		
645	650	655
Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile Arg Leu Lys Pro		
660	665	670
Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu Gly Ala		
675	680	685

<210> 71

<211> 368

<212> DNA

<213> Hepatitis C virus

<400> 71

aattcggaaa accaagtgga gggtagggc cagattgtgt caactgctgc ccaaacccttc	60
ctggcaacgt gcatcaatgg ggtgtctgg actgtctacc acggggccgg aacgaggacc	120
atcgctcac ccaagggtcc tgtcatccag atgtatacca atgttagacca agaccttgtg	180
ggctggcccg ctgcgcaagg taccgcgtca ttgacaccct gcacttgcgg ctcctcggac	240
ctttacctgg tcacgaggca cgccgatgtc attccgcgtc gccggcgggg tgatagcagg	300
ggcagcctcg tgtcgccccc gcccatttcc tacttgaaag gtcctcggg gggcccgctg	360
ccgaattc	368

<210> 72

<211> 122

<212> PRT

<213> Hepatitis C virus

<400> 72

Asn Ser Glu Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala			
1	5	10	15
Ala Gln Thr Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val			
20	25	30	
Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val			
35	40	45	
Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala			
50	55	60	
Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp			
65	70	75	80
Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg			
85	90	95	

Gly Asp Ser Arg Gly Ser Leu Val Ser Pro Arg Pro Ile Ser Tyr Leu  
100 105 110  
Lys Gly Ser Ser Gly Gly Pro Leu Pro Asn  
115 120

<210> 73  
<211> 208  
<212> DNA  
<213> Hepatitis C virus

<400> 73  
gaattcgggg gcctgctgtt gtgccccgcg gcagccgtgg gcatatttag ggccgcggtg 60  
tgcaccctgt gagtggctaa ggcgggtggac tttatccctg tggagaacct agagacaacc 120  
atgagggtccc cgggtttcac ggataactcc tctccaccag tagtgccccca gagcttccag 180  
gtggctcacc tccatgctcc ccgaattc 208

<210> 74  
<211> 69  
<212> PRT  
<213> Hepatitis C virus

<400> 74  
Glu Phe Gly Gly Leu Leu Leu Cys Pro Ala Ala Ala Val Gly Ile Phe  
1 5 10 15  
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile  
20 25 30  
Pro Val Glu Asn Leu Glu Thr Thr Met Arg Ser Pro Val Phe Thr Asp  
35 40 45  
Asn Ser Ser Pro Pro Val Val Pro Gln Ser Phe Gln Val Ala His Leu  
50 55 60  
His Ala Pro Arg Ile  
65

<210> 75  
<211> 281  
<212> DNA  
<213> Hepatitis C virus

<400> 75  
ccctgcactt gcggctcctc ggacctttac ctggcacgaa ggcacgcccga tgtcattccc 60  
gtgcgcggc ggggtgatag caggggcagc ctgctgtcgc cccggcccat ttcctacttg 120  
aaaggctcct cgggggggtcc gctgttgtc cccgcggggc acgcccgtggg catatttagg 180  
gccgcggtgt gcacccgtgg agtggctaag gcggtggact ttatccctgt ggagaaccta 240  
gagacaacca tgaggtcccc ggtgttacg gataactcct c 281

<210> 76  
<211> 93  
<212> PRT  
<213> Hepatitis C virus

<400> 76  
Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala

1	5	10	15												
Asp	Val	Ile	Pro	Val	Arg	Arg	Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	
			20				25					30			
Ser	Pro	Arg	Pro	Ile	Ser	Tyr	Leu	Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu
			35				40				45				
Leu	Cys	Pro	Ala	Gly	His	Ala	Val	Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys
			50				55				60				
Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	Asp	Phe	Ile	Pro	Val	Glu	Asn	Leu
	65			70				75				80			
Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	Phe	Thr	Asp	Asn	Ser			
			85				90								

<210> 77

<211> 416

<212> DNA

<213> Hepatitis C virus

<400> 77

attcggggca	cctatgttta	taaccatctc	actcctttc	gggactgggc	gcacaacggc	60
ttgcgagatc	tggccgtggc	tgttagagcca	gtcgtcttct	cccaaatgga	gaccaagctc	120
atcacgtggg	gggcagatac	cgccgcgtgc	ggtgacatca	tcaacggctt	gcctgtttcc	180
gccccgaggg	gcccggagat	actgctcggg	ccagccgatg	aatgggtctc	caagggttgg	240
aggttgctgg	cgcccatcac	ggcgtaacgcc	cagcagacaa	ggggcctccct	agggtgcata	300
atcaccagcc	taactggccg	ggacaaaaac	caagtggagg	gtgaggtcca	attgtgtca	360
actgctgccc	aaaccttcct	ggcaacgtgc	atcaatgggg	tgtgctggcc	gaattc	416

<210> 78

<211> 138

<212> PRT

<213> Hepatitis C virus

<400> 78

Ile	Arg	Gly	Thr	Tyr	Val	Tyr	Asn	His	Leu	Thr	Pro	Leu	Arg	Asp	Trp
1					5				10				15		
Ala	His	Asn	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	Pro	Val	Val
					20				25				30		
Phe	Ser	Gln	Met	Glu	Thr	Lys	Leu	Ile	Thr	Trp	Gly	Ala	Asp	Thr	Ala
					35				40			45			
Ala	Cys	Gly	Asp	Ile	Ile	Asn	Gly	Leu	Pro	Val	Ser	Ala	Arg	Arg	Gly
					50				55			60			
Arg	Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Met	Val	Ser	Lys	Gly	Trp
					65				70			75		80	
Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	Arg	Gly	Leu
					85				90			95			
Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	Asn	Gln	Val
					100				105			110			
Glu	Gly	Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Ala	Gln	Thr	Phe	Leu	Ala
					115				120			125			
Thr	Cys	Ile	Asn	Gly	Val	Cys	Trp	Pro	Asn						
					130				135						

<210> 79

<211> 308  
<212> DNA  
<213> Hepatitis C virus

<400> 79  
gaattcgggt ccgtcatccc gaccagcggc gatgttgcg tcgtcgcaac cgatgccctc 60  
atgaccggct ataccggcga ctgcactcg gtgatagact gcaatacgtg tgcacccag 120  
acagtcgatt tcagccttga ccctacccctc accattgaga caatcacgtt cccccaagat 180  
gctgtctccc gcactcaacg tcggggcagg actggcaggg ggaagccagg catctacaga 240  
tttgtggcac cgggggagcg cccctccggc atgttcgact cgtccgtcct ctgtgagtgc 300  
ccgaattc 308

<210> 80  
<211> 102  
<212> PRT  
<213> Hepatitis C virus

<400> 80  
Glu Phe Gly Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ala  
1 5 10 15  
Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile  
20 25 30  
Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro  
35 40 45  
Thr Phe Thr Ile Glu Thr Ile Thr Leu Pro Gln Asp Ala Val Ser Arg  
50 55 60  
Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg  
65 70 75 80  
Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val  
85 90 95  
Leu Cys Glu Cys Pro Asn  
100

<210> 81  
<211> 495  
<212> DNA  
<213> Hepatitis C virus

<400> 81  
attcggtcca ttgagacaat cacgctcccc caggatgctg tctccgcac tcaacgtcgg 60  
ggcaggactg gcagggggaa gccaggcatc tacagatttgc tggcaccggg ggagcgcccc 120  
tccggcatgt tcgactcgtc cgtcctctgt gagtgcatac acgcaggctg tgcttggat 180  
gagctcacgc ccggcagac tacagttagg ctacgagcgt acatgaacac cccggggctt 240  
cccggtgtgcc aggaccatct tgaattttgg gagggcgtct ttacaggcct cactcatata 300  
gatgcccact ttctatccca gacaaagcag agtggggaga accttcctta cctggtagcg 360  
taccaagcca ccgtgtgcgc tagggctcaa gcccctcccc catcgtgggaa ccagatgtgg 420  
aagtgtttga ttgcctcaa gcccaccctc catggccaa caccctgtct atacagactg 480  
ggcgctgccc aattc 495

<210> 82  
<211> 165  
<212> PRT

<213> Hepatitis C virus

<400> 82

Ile	Arg	Ser	Ile	Glu	Thr	Ile	Thr	Leu	Pro	Gln	Asp	Ala	Val	Ser	Arg
1				5				10						15	
Thr	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Lys	Pro	Gly	Ile	Tyr	Arg
				20				25						30	
Phe	Val	Ala	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	Ser	Ser	Val
					35			40					45		
Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	Leu	Thr	Pro
					50			55				60			
Ala	Glu	Thr	Thr	Val	Arg	Leu	Arg	Ala	Tyr	Met	Asn	Thr	Pro	Gly	Leu
					65			70			75			80	
Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val	Phe	Thr	Gly
					85				90				95		
Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	Gln	Ser	Gly
					100				105			110			
Glu	Asn	Leu	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	Cys	Ala	Arg
					115				120			125			
Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	Cys	Leu	Ile
					130			135			140				
Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	Tyr	Arg	Leu
					145			150			155			160	
Gly	Ala	Ala	Glu	Phe											
				165											

<210> 83

<211> 816

<212> DNA

<213> Hepatitis C virus

<400> 83

gaattcgggg	cggtgactt	tatccctgtg	gagaacctag	agacaaccat	gaggtccccg	60
gtgttcacgg	ataactcctc	tccaccagta	gtgccccaga	gcttccaggt	ggctcacctc	120
catgctccca	caggcagcgg	caaaagcacc	aaggtcccg	ctgcatatgc	agctcagggc	180
tataaggtgc	tagtactcaa	cccctctgtt	gctgcaacac	tgggctttgg	tgcttacatg	240
tccaaaggctc	atgggatcga	tcctaacatc	aggaccgggg	tgagaacaat	taccactggc	300
agccccatca	cgtactccac	ctacggcaag	ttccttgccg	acggcgggtg	ctcggggggc	360
gcttatgaca	taataatttgc	tgacgagtgc	cactccacgg	atgccacatc	catcttgggc	420
attggcactg	tccttgacca	agcagagact	gcgggggcga	gactggttgt	gctcgccacc	480
gccacccctc	cgggctccgt	cactgtgccc	catcccaaca	tcgaggaggt	tgctctgtcc	540
accacccggag	agatccctt	ttacggcaag	gctatcccc	tcgaagtaat	caaggggggg	600
agacatctca	tcttctgtca	ttcaaagaag	aagtgcgacg	aactcgccgc	aaagctggtc	660
gcattgggca	tcaatgccgt	ggcctactac	cgcggctttg	acgtgtccgt	catcccgacc	720
agcggcgatg	ttgtcgctgt	ggcaaccgat	gccctcatga	ccggctatac	cggcgacttc	780
gactcggtga	tagactgcaa	tacgtgtgcc	gaattc			816

<210> 84

<211> 272

<212> PRT

<213> Hepatitis C virus

<400> 84

Glu Phe Gly Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu Thr Thr  
1 5 10 15  
Met Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Val Val Pro  
20 25 30  
Gln Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys  
35 40 45  
Ser Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu  
50 55 60  
Val Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met  
65 70 75 80  
Ser Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr  
85 90 95  
Ile Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu  
100 105 110  
Ala Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp  
115 120 125  
Glu Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val  
130 135 140  
Leu Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr  
145 150 155 160  
Ala Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu  
165 170 175  
Val Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile  
180 185 190  
Pro Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser  
195 200 205  
Lys Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile  
210 215 220  
Asn Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr  
225 230 235 240  
Ser Gly Asp Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr  
245 250 255  
Thr Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Ala Glu Phe  
260 265 270

<210> 85

<211> 2523

<212> DNA

<213> Artificial Sequence

<220>

<223> vector cf1SODp600

<400> 85

atggctacaa accctgtttg cgtttgaag ggtgacggcc cagttcaagg tattattaac 60  
ttcgagcaga aggaaagtaa tggaccagtg aaggtgtggg gaagcattaa aggactgact 120  
gaaggcctgc atggattcca tggatcatgag tttggagata atacagcagg ctgtaccagt 180  
ccaggtcctc acttaatcc tctatccaga aaacacggtg ggccaaagga tgaagagagg 240  
catgttggag acttgggcaa tgtgactgct gacaaagatg gtgtggccga tgtgtctatt 300  
gaagattctg tgatctcaact ctcaggagac cattgcatca ttggccgcac actggtggtc 360  
cataaaaaag cagatgactt gggcaaaggt ggaaatgaag aaagtacaaa gacaggaaac 420

gctggaaatc	gtttggcttg	tggtgttaatt	gggatccgaa	ttcggggcac	ctatgttat	480
aaccatctca	ctcccttctcg	ggactggcg	cacaacgct	tgcagatct	ggccgtggct	540
gtagagccag	tcgtcttctc	ccaaatggag	accaagctca	tcacgtgggg	ggcagatacc	600
gccgcgtgcg	gtgacatcat	caacggcttg	cctgtttccg	cccgcagggg	ccggagata	660
ctgctcgggc	cagccgatgg	aatggtgtcc	aagggttga	ggttgtcggc	gcccacatcag	720
gcgtacgccc	agcagacaag	gggcctccta	gggtgcataa	tcaccagcct	aactggccgg	780
gacaaaaacc	aagtggaggg	tgaggtccag	attgtgtcaa	ctgctgcccc	aacccctctg	840
gcaacgtgca	tcatcaatgg	ggtgtgctgg	actgtctacc	acggggccgg	aacgaggacc	900
atcgctcac	ccaagggtcc	tgtcatccag	atgtataccca	atgtagacca	agacccctgtg	960
ggctggcccg	cttcgcaagg	tacccgctca	ttgacacccct	gcacttgcgg	ctcctcgac	1020
cttacactgg	tcacgaggca	cgccgatgtc	attcccgatgc	gccggcgggg	tgatagcagg	1080
ggcagcctgc	tgtcgccccg	gcccatttcc	tacttgaag	gctcctcggg	gggtccgctg	1140
ttgtgccccg	cggggcacgc	cgtggcata	tttagggccg	cggtgtgcac	ccgtggagtg	1200
gctaaggccg	tggactttat	ccctgtggag	aacctagaga	caaccatgag	gtccccggtg	1260
ttcacggata	actcctctcc	accagtagtgc	ccccagagct	tccaggtggc	tcacccat	1320
gctcccacag	gcagcggcaa	aagcaccaag	gtcccggtg	cataatgcgc	tcagggctat	1380
aagggtctag	tactcaaccc	ctctgttgc	gcaacactgg	gctttgggtgc	ttacatgtcc	1440
aaggctcatg	ggatcgatcc	taacatcagg	accgggggtga	gaacaattac	cactggcagc	1500
cccatcacgt	actccaccta	cgccaagttc	tttgcgcacg	gcgggtgctc	ggggggcgct	1560
tatgacataa	taatttgtga	cgagtgccac	tccacggatg	ccacatccat	cttgggcatt	1620
ggcactgtcc	ttgaccaagc	agagactgcg	ggggcgagac	tgggtgtgc	cgccaccgccc	1680
acccctccgg	gctccgtcac	tgtgccccat	cccaacatcg	aggaggttgc	tctgtccacc	1740
accggagaga	tccctttta	cgccaaggct	atccccctcg	aagaatcaa	ggggggggaga	1800
catctcatct	tctgtcattc	aaagaagaag	tgcgacgaac	tcgcccacaa	gctggtcgca	1860
ttgggcatca	atgcgtggc	ctactaccgc	ggtcttgcac	tgtccgtcat	cccgaccagc	1920
ggcgatgttg	tcgtcggtgc	aaccgatgcc	ctcatgaccg	gctataccgg	cgacttcgac	1980
tcggtgatag	actgcaatac	gtgtgtcacc	cagacagtcg	atttcagcct	tgaccctacc	2040
ttcaccattg	agacaatcac	gctcccccaa	gatgctgtct	cccgcactca	acgtcggggc	2100
aggactggca	gggggaagcc	aggcatctac	agatttgg	caccggggga	gcgcctccc	2160
ggcatgttcg	actcgccgt	cctctgtgag	tgctatgcac	caggctgtgc	ttggatgag	2220
ctcacgcccc	ccgagactac	agttaggcta	cgagcgtaca	tgaacacccc	ggggcttccc	2280
gtgtgccagg	accatcttga	attttggag	ggcgtctta	caggectcac	tcatatagat	2340
gcccaacttc	tatcccagac	aaagcagagt	ggggagaacc	ttccttacct	ggtagcgtac	2400
caagccaccc	tgtgcgttag	ggctcaagcc	cctccccat	cgtggacca	gatgtggaaag	2460
tgtttgattc	gcctcaagcc	caccctccat	gggccaacac	ccctgctata	cagactgggc	2520
gct						2523

<210> 86

<211> 841

<212> PRT

<213> Artificial Sequence

<220>

<223> vector cf1SODp600

<400> 86

Met Ala Thr Asn Pro Val Cys Val Leu Lys Gly Asp Gly Pro Val Gln

1 5 10 15

Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys Val

20 25 30

Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His Val

35 40 45

His Glu Phe Gly Asp Asn Thr Ala Gly Cys Thr Ser Pro Gly Pro His  
 50 55 60  
 Phe Asn Pro Leu Ser Arg Lys His Gly Gly Pro Lys Asp Glu Glu Arg  
 65 70 75 80  
 His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val Ala  
 85 90 95  
 Asp Val Ser Ile Glu Asp Ser Val Ile Ser Leu Ser Gly Asp His Cys  
 100 105 110  
 Ile Ile Gly Arg Thr Leu Val Val His Glu Lys Ala Asp Asp Leu Gly  
 115 120 125  
 Lys Gly Asn Glu Glu Ser Thr Lys Thr Gly Asn Ala Gly Ser Arg  
 130 135 140  
 Leu Ala Cys Gly Val Ile Gly Ile Arg Ile Arg Gly Thr Tyr Val Tyr  
 145 150 155 160  
 Asn His Leu Thr Pro Leu Arg Asp Trp Ala His Asn Gly Leu Arg Asp  
 165 170 175  
 Leu Ala Val Ala Val Glu Pro Val Val Phe Ser Gln Met Glu Thr Lys  
 180 185 190  
 Leu Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn  
 195 200 205  
 Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro  
 210 215 220  
 Ala Asp Gly Met Val Ser Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr  
 225 230 235 240  
 Ala Tyr Ala Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser  
 245 250 255  
 Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Ile Val  
 260 265 270  
 Ser Thr Ala Ala Gln Thr Phe Leu Ala Thr Cys Ile Ile Asn Gly Val  
 275 280 285  
 Cys Trp Thr Val Tyr His Gly Ala Gly Thr Arg Thr Ile Ala Ser Pro  
 290 295 300  
 Lys Gly Pro Val Ile Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val  
 305 310 315 320  
 Gly Trp Pro Ala Ser Gln Gly Thr Arg Ser Leu Thr Pro Cys Thr Cys  
 325 330 335  
 Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro  
 340 345 350  
 Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro  
 355 360 365  
 Ile Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ala  
 370 375 380  
 Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val  
 385 390 395 400  
 Ala Lys Ala Val Asp Phe Ile Pro Val Glu Asn Leu Glu Thr Thr Met  
 405 410 415  
 Arg Ser Pro Val Phe Thr Asp Asn Ser Ser Pro Pro Val Val Pro Gln  
 420 425 430  
 Ser Phe Gln Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser  
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 Thr Lys Val Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val  
 450 455 460

Leu Asn Pro Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser  
 465 470 475 480  
 Lys Ala His Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile  
 485 490 495  
 Thr Thr Gly Ser Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala  
 500 505 510  
 Asp Gly Gly Cys Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu  
 515 520 525  
 Cys His Ser Thr Asp Ala Thr Ser Ile Leu Gly Ile Gly Thr Val Leu  
 530 535 540  
 Asp Gln Ala Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala  
 545 550 555 560  
 Thr Pro Pro Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val  
 565 570 575  
 Ala Leu Ser Thr Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro  
 580 585 590  
 Leu Glu Val Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys  
 595 600 605  
 Lys Lys Cys Asp Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn  
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 Ala Val Ala Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser  
 625 630 635 640  
 Gly Asp Val Val Val Ala Thr Asp Ala Leu Met Thr Gly Tyr Thr  
 645 650 655  
 Gly Asp Phe Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr  
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 Val Asp Phe Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Ile Thr Leu  
 675 680 685  
 Pro Gln Asp Ala Val Ser Arg Thr Gln Arg Arg Gly Arg Thr Gly Arg  
 690 695 700  
 Gly Lys Pro Gly Ile Tyr Arg Phe Val Ala Pro Gly Glu Arg Pro Pro  
 705 710 715 720  
 Gly Met Phe Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys  
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 Ala Trp Tyr Glu Leu Thr Pro Ala Glu Thr Thr Val Arg Leu Arg Ala  
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 Tyr Met Asn Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe  
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 Gln Ala Thr Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp  
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36